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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,811	03/30/2004	Yasuhiro Takeda	57810-095	2835

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EXAMINER

LANDAU, MATTHEW C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 03/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,811

Applicant(s)

TAKEDA ET AL.

Examiner

Matthew Landau

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 2 and 7-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/30/2004</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I (claims 1-17) and Species I, in the reply filed on December 29, 2005 is acknowledged.

Applicant indicated that claims 1 and 3-6 read on the elected species. Therefore, claims 2 and 7-30 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention or species, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the limitation "fluorine is introduced into at least any of regions extending over the junction interfaces between said first conductivity type semiconductor region and said second conductivity type source/drain regions, at least the interface between the gate insulator film and the central region of said channel region as well as said gate insulator film, and said side wall insulator films" renders the claim indefinite. It is unclear what regions must contain fluorine in order to satisfy the claim limitations. The additional "at least" appears to be the problem. It is suggested Applicant remove the second "at least". For the purposes of this Office Action, it is considered that fluorine is introduced into at least one of the following: 1)

Art Unit: 2815

regions extending over the junction interfaces between said first conductivity type semiconductor region and said second conductivity type source/drain regions, 2) the interface between the gate insulator film and the central region of said channel region as well as said gate insulator film, or 3) said side wall insulator films.

Further regarding claim 1, the limitation "the junction" lacks sufficient antecedent basis in the claim. Note that claims 5 and 6 have the same problem.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 3-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Ono et al. (US Pat. 6,436,783, hereinafter Ono).

Regarding claims 1, 3, and 4, Figures 1-4 of Ono disclose a semiconductor device comprising: a first conductivity type semiconductor region (silicon substrate 1) (col. 11, lines 63-65) having a main surface (upper surface); a second conductivity type source/drain region (16/22) formed on said main surface to hold a channel region therebetween at a prescribed interval; a gate electrode 20 formed on said channel region through a gate insulator film 7; and side wall insulator films 18 (silicon oxide) (col. 21, lines 53-55) formed on the side surfaces of said gate electrode. Ono discloses fluorine is introduced into the channel region (col. 13, lines 10-12). The channel region extends over a junction interface between the source/drain regions

Art Unit: 2815

(16/22) and the substrate 1. Therefore, Figures 1-4 of Ono disclose fluorine is introduced into regions extending over the junction interfaces between said first conductivity type region and said second conductivity type source/drain regions.

Regarding claim 5, Figures 1-4 of Ono disclose a semiconductor device comprising: a first conductivity type semiconductor region (substrate 1) having a main surface; and a second conductivity type impurity region (16/22) formed on said main surface of said semiconductor region, wherein an element of fluorine is introduced into a region (channel region) extending over the junction interface between said first conductivity type semiconductor region and said second conductivity type impurity region (col. 13, lines 10-12).

Claims 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Mandelman et al. (US PGPub 2003/0020125, hereinafter Mandelman).

Regarding claim 5, Figure 10 of Mandelman discloses a semiconductor device comprising: a first conductivity type semiconductor region (substrate 10) having a main surface; and a second conductivity type impurity region (90/95/130) formed on said main surface of said semiconductor region, wherein an element of carbon is introduced into a region (97/99) extending over the junction interface between said first conductivity type semiconductor region and said second conductivity type impurity region (paragraph [0050]).

Regarding claim 6, Figure 10 of Mandelman discloses said impurity region (90/95/130) includes a low-concentration impurity region (90/95) (LDD regions) (paragraph [0050]) and a high concentration impurity region 130 (source/drain region), and said element of carbon is introduced into at least a region (97/99) extending over the junction interface between said first

Art Unit: 2815

conductivity type semiconductor region and said high-concentration impurity region. Note that Figure 10 shows regions 97 and 99 extend over a part of the junction interface between the source/drain regions 130 and the substrate.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (571) 272-1731.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on (571) 272-2298. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should any questions arise regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Matthew C. Landau

February 24, 2006